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**BUSINESS REPLY MAIL**

FIRST CLASS PERMIT NO. 205 Santa Barbara,

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Santa Barbara, California

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## **INFRARED INDUSTRIES, INC.**

We've been serving our customers with the products of some of the country's leading manufacturers. In electro-optical technology, such a leader is Infrared Industries, Inc., a dominant supplier to the military and industry. A helpful (and fact-filled) representative will be glad to discuss how at least one of Infrared Industries' many specialities may provide a solution to your problems. Just fill in the Free Application Survey or give us a phone call. No obligation, naturally.

**INFRARED INDUSTRIES, INC.**  
P. O. Box 989  
Santa Barbara, California  
(805) 684-4181



**microvolt signal  
processing**

Instruments developed for infrared technology created this line—suitable wherever low noise characteristics are vital. Example: IRI's microvoltmeter indicates  $2.2 \times 10^{-10} V(\text{per } cps^{1/2} @ 5KC)$ .

Over 50 catalog units include:  
amplifiers, pre-amps,  
calibrators, integrators,  
microvoltmeters

Get special combination  
tech bulletin.

**INFRARED  
Industries Inc.**

Santa Barbara, California  
Phone 684-4181 (Area Code 805)

Created expressly for infrared signal processing where low noise characteristics are *imperative*.

Here is a comprehensive instrument line which can be applied effectively to other disciplines having similar low noise requirements.



# Low Noise Instruments

INFRARED INDUSTRIES, INC. Santa Barbara, Calif. (805) 684-4181

IRI provides a select line of amplifiers, pre-amps and microvoltmeters with unique sensing capabilities for low-noise, microvolt signal processing. For example, IRI Tunable Microvoltmeter measures signals .003 microvolts to 1 volt over a wide range of frequencies; a solid-state miniature (less than 1 cubic inch) low-noise pre-amplifier has extremely low-noise figure over a wide temperature range (1.1 to 1.8 db or less from minus 40°C to plus 100°C).

Model 600-601  
with pre-amps



Broadband Amplifiers	Input $\frac{1}{Z}$	Freq. Resp.	Max. Gain	ENI V/cps $^{1/2}$
603	40 megs	2 cps-200 kc	4000	$1.2 \times 10^{-8}$
604 B	35 megs	1 cps-300 kc	0.95	$1.3 \times 10^{-8}$
605	40 k ohms	2 cps-200kc	4000	$1 \times 10^{-8}$
Tuned Amplifiers		depends on	pre-amp	
600			pre-amp	
601		depends on	pre-amp	
			Tuning Range	Min. Band Width
600			10 cps-10 kc	40% center frequency
601			1 cps-1 kc	40% center frequency
Pre-Amplifiers	Input $\frac{1}{Z}$	Freq. Resp.	Max. Gain	ENI V/cps $^{1/2}$
6001 }	1 meg	depends on tuned Amp.		$8 \times 10^{-9}$
6011 }		depends on tuned Amp.		
6002 A }	40 megs	depends on tuned Amp.		$1.2 \times 10^{-8}$
6012 A }		depends on tuned Amp.		
6003 }	15 ohms	depends on tuned Amp.		$3.2 \times 10^{-10}$
6013 }		depends on tuned Amp.		
6004 }	10-10 k ohms	depends on tuned Amp.		$2.2 \times 10^{-10}$
6014 }				
			Noise Figure	
606	10 megohms	1 cps-2 kc	10	$\leq 1$ db
615	5-25 ohms	10 cps-50' kc	50,000	$\leq 2$ db
616	25-100 ohms	10 cps-50 kc	50,000	$\leq 2$ db
617	100 k ohms	5 cps-1 mc	1000	$\leq 2$ db

**Bias Supplies** The IRI Bias Supplies use laboratory calibrated mirrored scale meters. Separate meters monitor both voltage and current and provide a continuous check of transducer operating resistance. Spring cushions at each end of the meter movement permit up to 500% accidental overload. Voltage ranges are continuously adjustable from 0 to 110% of full scale.

Model	Output Ranges (volts)	Output Current (microamps)	Maximum Source Resistance
501A	15, 50, 150, 500	10, 30, 100, 300, 1,000	65k shunted by 1 $\mu$ fd
502	10, 30, 100, 300, 1,000	10, 30, 100, 300, 1,000, 3,000, 10,000	128k shunted by 1 $\mu$ fd
503	$\pm 15$ , $\pm 50$ , $\pm 150$ , $\pm 500$ 3 terminal output (+, common, -)	10, 30, 100, 300, 1,000	70k shunted by 1 $\mu$ fd

**Integrator** The IRI Model 602 eliminates the uncertainty of ordinary noise measurement. Readout occurs only after the selected integration time and provides a single-valued non-ambiguous noise reading. Repeatability of 1% is attainable. Integration times ranging from 2 to 120 seconds may be selected by a front panel control. Two input jacks are available with a selector switch. Front panel calibration controls.



**Voltage Calibrator** The IRI Model 225 is a precision source of true RMS voltages from 0.5 microvolt to 1.0 volt when used with an oscillator or signal generator. Vernier control allows accurate setting of the input signal. The temperature-compensated thermal meter assures true RMS voltage output regardless of input waveform. Operates from dc through 250kc, with output accuracy to within  $\pm 1\%$  (DC to 10 KC). Ten-turn control is direct-reading in microvolts.



## Request for Free Application Survey

Yes, and without obligation, I'd like to know more about the product lines checked:

- Temperature Measurement Instruments  
 Low Noise, Low Voltage Instrumentation  
 Collimators     Blackbodies     Scanners  
 Infrared Test Labs     IR Control/Alarm

But remember, I want facts, not "conversation."

My problem involves \_\_\_\_\_

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Remarks \_\_\_\_\_

Name \_\_\_\_\_

Title \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_

Phone \_\_\_\_\_ Ext: \_\_\_\_\_

Demonstration     More Information



# Condensed Specifications

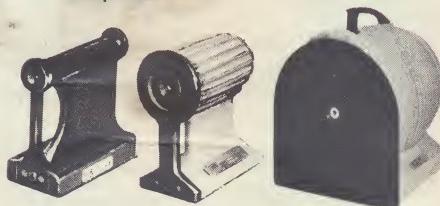
## INFRARED INDUSTRIES, INC.

Telephone (805) 684-4181 / Santa Barbara, California

## RELATED DIVISIONAL ACTIVITIES

### Blackbodies

and temperature controllers



IRI blackbody sources are accurately adjustable radiant energy standards for the calibration of infrared radiation detectors, other infrared sources and measuring instruments. IRI all-transistorized temperature controllers maintain source temperatures to within  $\pm 1^\circ$  at any selected point in range. Source temperatures extend to  $1400^\circ\text{C}$ . Some features of IRI blackbodies are: Fast warm-up; selectable energy levels by interchangeable apertures; choice of physical configuration; provision for chopper; closed-loop electrical temperature control; air or water cooled; PLUS exclusive internal certified thermocouple.

Model	Temp.	Cavity	Field	W.U.*	HxWxD"
403	325-1000°K	0.5"	14°	30	10½x8x8½
404	50-1000°C	0.5"	14°	45	11¼x10x9
405	325-1000°K	1.0"	30°	60	10½x8x9½
406	50-1000°C	1.0"	30°	60	11½x10x9
407A	200-600°C	0.080"	10°	5	3½x1¾x3½
408	200-600°C	0.250"	90°	5	5½x3x4¾
417	50-1000°C	3.0"	18°	90	22x18x26
420	200-1200°C	0.5"	14°	45	11½x10x9
427	200-600°C	.080"	14°	3	¾ dia. x 3½ lg.
432	400-1400°C	0.5"	12°	150	11½x10x9
435	150-1000°F	—	—	30	6½x11½x8½
436†	400-1500°C	0.5"	3°	180	10x12x13

\*W.U. Warm-up time in minutes

†Includes NON-AUTOMATIC, manual control

### Modulators



The IRI Series 801 modulators chop, or modulate, radiant energy at a desired frequency with a stability of  $\pm 1\%$ .

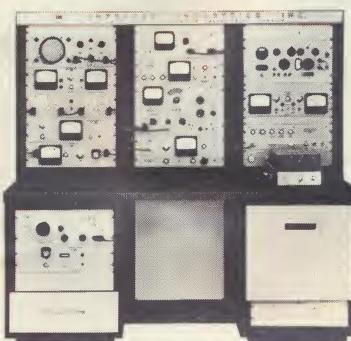
Model	Freq. Cps.	Max. Aperture
801A	2-200	0.75"
801B	10-1000	0.75"
801C	50-5000	0.2"
801D	100-10,000	0.1"
801E	300-30,000	.03"

Stability  $\pm 1\%$       Meter Accuracy 1% F.S.

### Voltage Calibrator

The IRI Model 225 Voltage Calibrator is a precision source of true RMS voltages from 0.5 microvolt to 1.0 volt when used with an oscillator or signal generator.

### Infrared Test Labs



For precision measurement of infrared and other transducers there are many models of consoles, ranging from a basic system at minimum cost up through a comprehensive system, which provide a wide variety of features and versatile performance. IRI consoles measure and record signal, noise, noise-to-signal ratio, resistance and optimum bias at a controlled temperature of an array or single mounted detectors. They perform these tests more rapidly than has been heretofore possible. IRI test consoles permit the most comprehensive, compact, trouble-free testing sequences.

MODEL	DESCRIPTION
300	Basic System
300A	Standard System
301	Custom System
302	Comprehensive System

### Integrator

Model 602



The IRI Model 602 provides a single-valued non-ambiguous noise reading with repeatability of 1%.

### Collimators

Convenient laboratory sources of parallel radiation at any wavelength are found in IRI off-axis collimators. Production models incorporate useful design features such as clear exit apertures, collimation accuracy at all wavelengths (infrared, visible, ultraviolet) of 0.2 milliradians, mounting base for energy sources.

Model	Description	Coll. Accur.	Wgt.
230	Off-Axis, 5"	.2 milliradians	56 lbs.
232	Off-Axis, 8"	.2 milliradians	175 lbs.
234	On-Axis Newtonian, 10"	.02 milliradians	175 lbs.
235	Off-Axis, 8"	.2 milliradians	35 lbs.

IR instrumentation systems—in addition to detectors—usually require optical components and electronic signal processing. Fast and effective solutions to customer problems in all of these areas can be expected from IRI because these facilities are under one roof in a modern plant especially built for these purposes.

### OPTICS

The Optical Systems Division—one of the largest precision manufacturing facilities in the U.S.—has extensive capabilities in reticles, mirrors, optical components (flats, spherics and aspherics) generated from conventional and exotic substrates, precision mountings, and systems. The Optical Systems Division applies 40 years of experience to the solution of scientific optical problems.

### PHOTOCONDUCTORS

The Photoconductor Division (Infrared Detectors) located in Waltham, Mass., is the largest research and production facility in the country for IR detectors and interference filters. Lead sulphide, indium antimonide and lead selenide detectors are produced in a wide variety of mounts, cell sizes and configurations. Interference filters in various bandwidths are available to cover ranges beyond 15 microns.

### SYSTEMS R&D

In-house research on all aspects of IR technologies is, of course, a continuing effort by all divisions. Close operational liaison between all research groups permits highly productive output for industry and government on applied research projects involving electro-optical techniques. Your inquiry is invited.



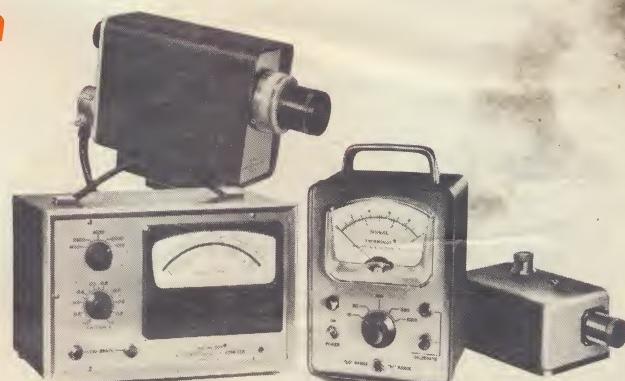
# Condensed Specifications

## INFRARED INDUSTRIES, INC.

Telephone (805) 684-4181 / Santa Barbara, California

### Low Noise Instrumentation

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Broadband Amplifiers	Input Z	Freq. Resp.	Max. Gain	ENI V/cps <sup>1/2</sup>						
603	40 megs	2 cps-200 kc	4000	$1.2 \times 10^{-8}$						
604 B	35 megs	1 cps-300 kc	0.95	$1.3 \times 10^{-8}$						
605	40 k ohms	2 cps-200kc	4000	$1 \times 10^{-8}$						
Tuned Amplifiers				depends on pre-amp						
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New specs: 4% center frequency				<table border="1"> <tr> <th>Tuning Range</th> <th>Min. Band Width</th> </tr> <tr> <td>10 cps-10 kc</td> <td>40% center frequency</td> </tr> <tr> <td>1 cps-1 kc</td> <td>40% center frequency</td> </tr> </table>	Tuning Range	Min. Band Width	10 cps-10 kc	40% center frequency	1 cps-1 kc	40% center frequency
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Model	Output Ranges (volts)	Output Current (microamps)	Maximum Source Resistance
501A	15, 50, 150, 500	10, 30, 100, 300, 1,000	65k shunted by 1 $\mu$ fd
502	10, 30, 100, 300, 1,000	10, 30, 100, 300, 1,000, 3,000, 10,000	128k shunted by 1 $\mu$ fd
503	$\pm 15, \pm 50, \pm 150, \pm 500$ 3 terminal output (+, common, —)	10, 30, 100, 300, 1,000	70k shunted by 1 $\mu$ fd

### Thermodot®

non-contact temperature measurement

More than thirty-five Thermodot models perform a wide variety of non-contact temperature measurement functions ranging from fast-response quality control scanners for measuring the temperature of printed circuits under load, to recording the temperatures of flame and of objects through flame. Moving objects, glass, molten metals — even in corrosive or radio-active environments — can be accurately sensed without contact, with precision repeatability, and a high degree of resolution — spot size as tiny as .030".

Model No.	Temp. Range	Model No.	Temp. Range
TD-1	100 - 8000°F	TD-6AH	250 - 5000°F
A160	100 - 16000°F	AHT15	430 - 1500°F
TD-5	100 - 8000°F	AHT70	970 - 7000°F
TD-6A	210 - 3300°F	AHTC8	220 - 800°C
AT8	250 - 800°F	AHTC39	520 - 3900°C
AT15	430 - 1500°F	TD-6BH	250 - 5000°F
AT70	970 - 7000°F	BHT15	430 - 1500°F
ATC5	140 - 500°C	BTT70	970 - 7000°F
ATC8	220 - 800°C	BHTC8	220 - 800°C
ATC15	320 - 1500°C	BHTC39	520 - 3900°C
ATC30	670 - 3000°C	AG	560 - 4000°F
ATC39	520 - 3900°C	BG	560 - 4000°F
TD-6B	210 - 3300°F	TD-8	175 - 2000°F
BT8	250 - 800°F	8G	320 - 3000°F
BT15	430 - 1500°F	TD-9F	1400 - 8300°F
BT70	970 - 7000°F	9FH	1840 - 8300°F
BTC5	140 - 500°C	TD-9C	760 - 4590°C
BTC8	220 - 800°C	9CH	1000 - 4590°C
BTC15	320 - 1500°C		
BTC30	670 - 3000°C		
BTC39	520 - 3900°C		





# Thermodot®

non-contact remote  
temperature measurement

**INFRARED INDUSTRIES, INC.** Santa Barbara, Calif. (805) 684-4181



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AT15	430 - 1500°F	TD-6BH	250 - 5000°F
AT70	970 - 7000°F	BHT15	430 - 1500°F
ATC5	140 - 500°C	BTT70	970 - 7000°F
ATC8	220 - 800°C	BHTC8	220 - 800°C
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BT70	970 - 7000°F	9FH	1840 - 8300°F
BTC5	140 - 500°C	TD-9C	760 - 4590°C
BTC8	220 - 800°C	9CH	1000 - 4590°C
BTC15	320 - 1500°C		
BTC30	670 - 3000°C		
BTC39	520 - 3900°C		

## Thermodot Modifications

**High Resolution** — Smaller detectors and smaller apertures are available to provide better resolution than standard models; spot size as small as 0.030".

**Recorder Output** — 100 millivolt full scale in place of 10 millivolt output.

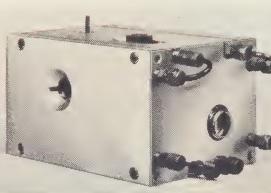
**Current Output** — 500 microampere full scale output in place of 10 MV. recorder output.

**"Glass" Filters** — Special filters and detectors to permit measurement of surface temperature of glass.

**Increased Response Time** — Increased by a factor of 10, from 0.3 seconds to 0.03 seconds.

**Power Changes** — 50 cps in place of standard 60 cps; 220 V AC power supply instead of standard 110 V AC; 220 V AC in combination with 50 cps frequency.

## Thermodot Accessories



*Model WB-1 water cooled base* permits operation in ambient temperatures as high as 175°F; completely enclosed optical head for ambient temperatures as high as 210°F. (WB-2, as shown.)

Heavily stitched and riveted carrying case. Simulated leather. Protects portable model Thermodots.



*M-2 swivel base mount* (shown) for fixed position optical head.

*M-1 tripod mount* permits panning and tilting for fast target sighting.  
3-section heavy duty legs.

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## Request for Free Application Survey

**Yes**, and without obligation, I'd like to know more about the product lines checked:

- Temperature Measurement Instruments  
 Low Noise, Low Voltage Instrumentation  
 Collimators     Blackbodies     Scanners  
 Infrared Test Labs     IR Control/Alarm

But remember, I want facts, not "conversation."

My problem involves \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Remarks \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Name \_\_\_\_\_

Title \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_

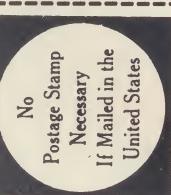
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- Demonstration     More Information

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Santa Barbara, California

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Santa Barbara, California  
(805) 684-4181

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INC.**

We've been serving our customers with the products of some of the country's leading manufacturers. In electro-optical technology, such a leader is Infrared Industries, Inc., a dominant supplier to the military and industry. A helpful (and fact-filled) representative will be glad to discuss how at least one of Infrared Industries' many specialities may provide a solution to your problems. Just fill in the Free Application Survey or give us a phone call. No obligation, naturally.

**Non-contact  
temperature  
measurement to  
16,000°F**



For accurate remote temperature measurement of glass, flame, molten metals, moving parts — even in radio-active and corrosive environments. 35 models, from 100° to 16,000°F. Ask for demonstration, now.

MEASURES / RECORDS / CONTROLS

**THERMODOT®**

IR RADIATION PYROMETER

**INFRARED INDUSTRIES, INC.**  
Radiation Electronics Division

SANTA BARBARA, CALIFORNIA (805) 684-4181

Whatever you make . . .  
needs heat, or causes it.  
Thermodot® may be the answer  
to temperature measurement  
problems in your business.

